

DIRECTIONS

P. 21

FOR USING

THOMAS'S
NEGATIVE COLLODION,

INCLUDING THE PREPARATION OF A

NORMAL NITRATE OF SILVER BATH;

ALSO

A FEW REMARKS

IN REFERENCE TO THE USE OF THE VARIOUS

COLLODIONS & IODIZING SOLUTIONS,

PREPARED BY

R. W. THOMAS,

TO WHICH IS ADDED

HOW TO PRINT FROM THE NEGATIVE,
DIRECTIONS FOR CLEANING THE GLASS PLATE
HOW TO VARNISH THE NEGATIVE,

AND A

DESCRIPTIVE CATALOGUE

OF

PHOTOGRAPHIC APPARATUS, &c.,

MANUFACTURED AND SOLD BY

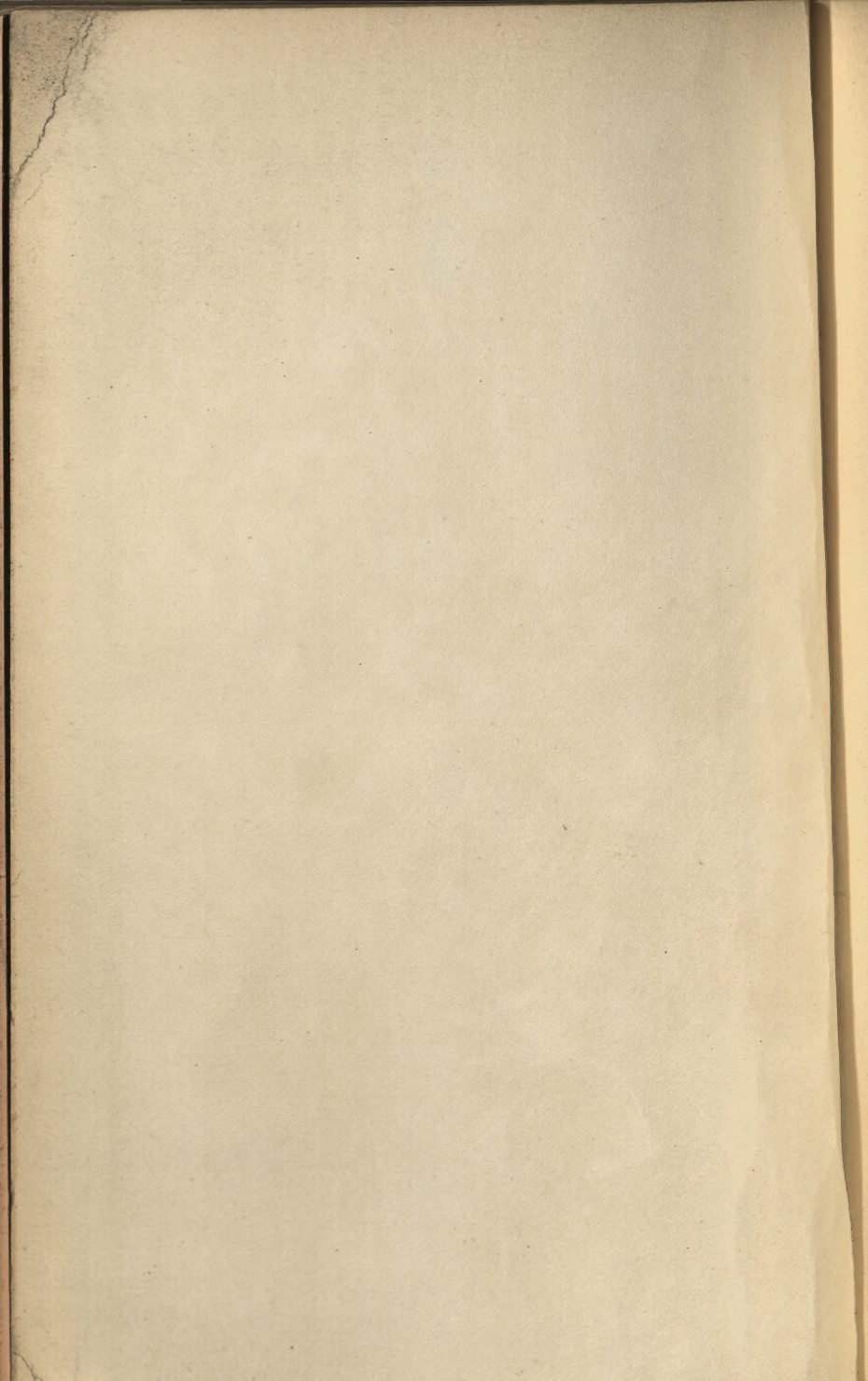
RICHARD WHEELER THOMAS,

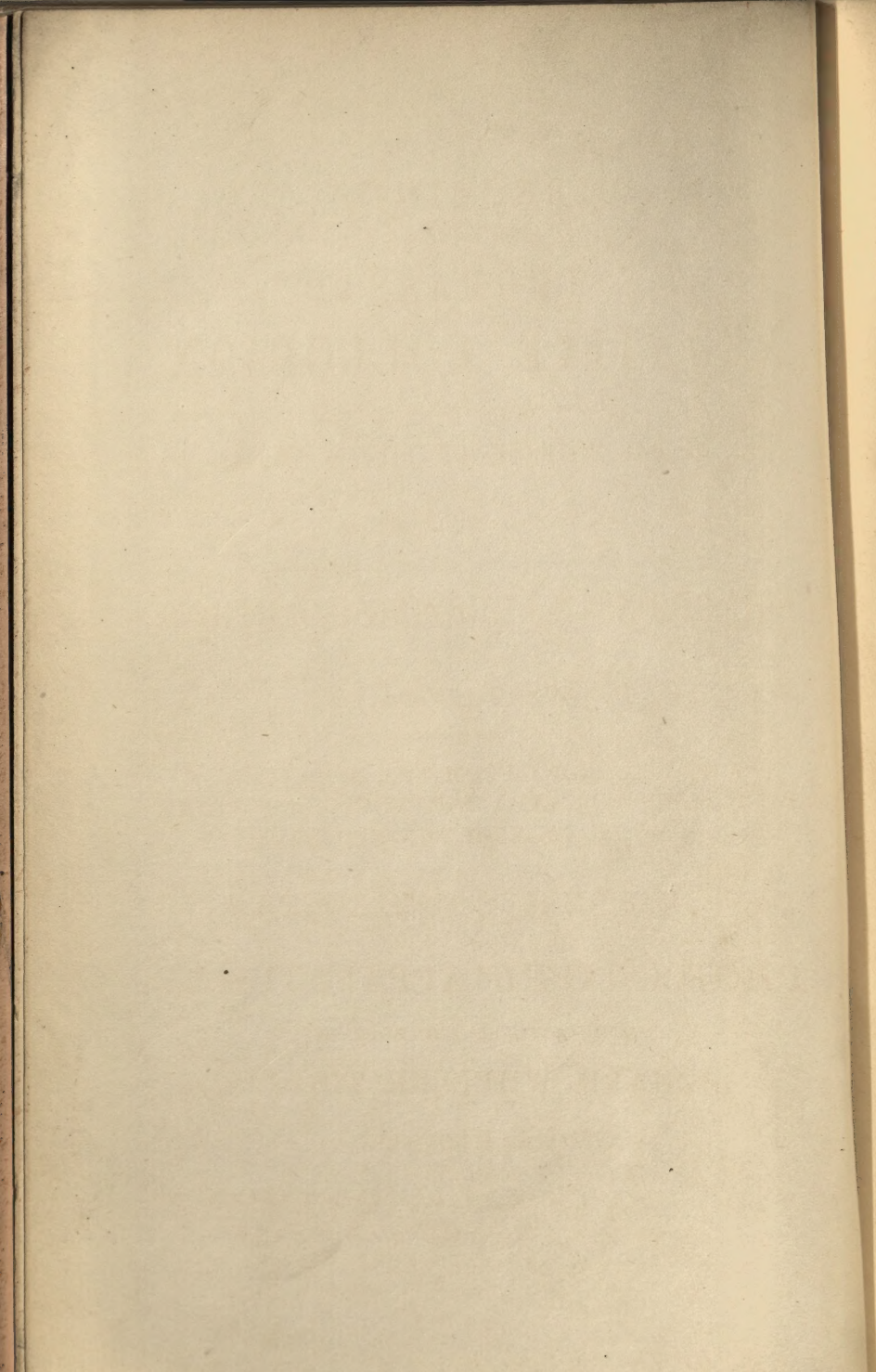
Operative Chemist, &c.,

10, PALL MALL, LONDON.

ENTERED AT STATIONERS' HALL,

1861.





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DIRECTOR

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DIRECTIONS
FOR USING
THOMAS'S
NEGATIVE COLLODION,

PREPARED SOLELY BY
RICHARD W. THOMAS,
Chemist, &c.,
10, Pall Mall,

MANUFACTURER OF PURE

PHOTOGRAPHIC CHEMICALS, PREPARATIONS & APPARATUS.

INTRODUCTORY REMARKS.

In consequence of improvements lately made in my laboratory, I can now guarantee the perfection of every bottle of Collodion bearing my red label, with name and address engraved thereon. I mean by this guarantee, and by this term perfection, that in the present state of our chemical knowledge it is impossible to make a Collodion better adapted for the production of Negative Pictures on glass, both as regards sensitiveness, keeping quality, proper intensity, and a freedom from imperfection in the shape of spots and stains. I guarantee also that my Negative Collodion possesses a most important and valuable property, viz., it does not render the Nitrate of Silver Bath Alkaline, the bath may be used neutral.

RICHARD WHEELER THOMAS.

DIRECTIONS
FOR THE
THOMAS
NEGATIVE COLLODION

PREPARED BY
THOMAS W. THOMAS
OF
NEW YORK

THE NEGATIVE COLLODION PREPARATIONS & VARIATIONS

INTRODUCTORY REMARKS

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the manner of giving quality, proper intensity, and a
correct color, to the impression on the plate of glass, and
also, I guarantee also that my Negative Collo-dion
is a most important and valuable property, and
I do not mean to say that it is of Silver Salt Alkali.
The following may be used as usual.

RICHARD WHEELER THOMAS

REMARKS ON THE BROMIZER

WHICH MAY BE USED WITH ANY OF THOMAS'S
PREPARATIONS OF COLLODION.

THE Bromizer diminishes intensity and prevents solarization when a long exposure in the camera is necessary, in order to render harmoniously green and white, or strongly contrasted objects: it may be used for checking intensity generally, when working with lenses of short focal length.

The quantity recommended neither adds to nor diminishes the sensitiveness of Iodized Collodion. The addition, however, of a Bromide, is attended with most beneficial results at times, and in some lights. A gradual increase of the quantity is capable of producing gradations of shade in the intensity of negatives of a most marked and definite character; quite as much so as when drawing pencils of different degrees of hardness are used for producing different shades of black on paper. Independent of this property, the Bromide has a marked effect in checking solarization, and consequently admits of a longer exposure of the plate in the camera. It is, nevertheless, most undesirable that a Collodion for general purposes, should contain a notable quantity of Bromide; in a dull light, the intensity produced is not sufficient, hence the advantage of a separate Bromizer, the dose of which can be so easily adjusted to the requirements of the operator, the condition of light, the time of year, or the aspect of the glass room.

Five minims of the Bromizer, or more if required, may be added to each ounce of Iodized Collodion.

PREPARED BY

R. W. THOMAS, Chemist, 10, Pall Mall.

Sold in 1oz. stoppered bottles, 1s. 3d. each.

REMARKS ON THE BROMINER

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Five minims of the Brominer, or more if required, may be added to each ounce of Iodized Collodion.

DIRECTIONS.

1.—The edges of the glass should be ground all round, also slightly on the surface of the edge; this prevents contraction of the film, and enables it to resist the action of a heavy stream of water.

2.—To CLEAN THE GLASS IF NEW.—Make a mixture of Spirits of Wine and Liquor Ammoniaë, equal parts; render it as thick as cream with Tripoli, with a piece of cotton wool kept for this purpose rub a small quantity over that side ground as described, wash well under a tap of water, and wipe dry with a piece of old linen, washed without soap, and kept scrupulously clean for this purpose. Plates should not, however, be cleaned in the operating room with the above mixture, the vapour of Ammonia might prove injurious to the Chemicals.—*Vide* also my paper on cleaning the plate.

3.—Now polish with an old white silk handkerchief; if this latter precaution be not taken small particles of linen will be left upon the plate; these are perhaps only seen when draining off the Collodion; they form nuclei and eddies, checking the Collodion in its course; some of these minute fibres are washed off and contaminate the next picture. To all lovers of clean pictures my advice therefore is, having well dried the plate with old linen, lay it, clean side upwards, upon a few sheets of common glazed demy paper (not blotting), and rub it hard with the silk until sensibly warm; this has the double advantage of dispersing fibres and moisture, for all glass plates

are slightly in a hygrometric condition. Double the silk rubber up to form a pad, and with this the glass must be firmly dusted down just before pouring on the Collodion, which will then run most evenly; if the coated plate is now viewed by transmitted light not a speck or blemish will be seen upon it. When a plate, cleaned as above described, is breathed upon, the moisture does not evaporate slowly but *flies off*. Do not be afraid of putting the glass into an electrical condition with the silk rubber; on this account objections have been raised to the use of silk; practically, however, I find it a most valuable auxiliary in this starting point of the process, the perfect manipulation of which makes an important difference in the value of the finished picture. What can be more unartistic and annoying to an educated eye than spots, patches, stars, and sky rockets, the forms and shapes of which rival, in numberless variety, a display of fireworks; let us not, therefore, be contented with pictures, how good in other respects, presenting these deformities—so many blots on the photographic escutcheon.

N.B.—To CLEAN A GLASS AFTER HAVING USED IT, WHEN NOT VARNISHED.—Wash off the Collodion film with water, and dry as above.

To COAT THE PLATE.—First remove all the particles of dried Collodion from the mouth of the bottle. Now pour upon the centre of the cleaned glass as much Collodion as it will hold; do not perform this operation hurriedly; take time, and systematically incline the plate in such a manner that the Collodion may run into each corner in succession; when perfectly covered, pour off gently the excess into the bottle at

one of the corners nearest to you; with observation and practice, dexterity is easily acquired. There are many ways of coating the plate; each person will adopt that which practice teaches him is best. The pneumatic plate holder is a convenient little instrument to use for holding the plate whilst pouring on the Collodion, it may be used for both small and large plates.

N.B.—Keep the corner of the glass plate in contact with the neck of the bottle whilst pouring off the Collodion, otherwise the film will be wavy in places.

4.—As soon as the Collodion ceases to run, plunge the prepared glass gently without stopping into the Nitrate of Silver Bath. — *Vide* instructions for making the Nitrate of Silver Bath.

N.B.—Mr. THOMAS prepares this bath ready for use; it may be had from him for a little more than the cost of the Nitrate of Silver used.

5.—Allow the prepared glass to remain in this bath from five to ten minutes, according to the temperature. Just before taking it out, move it up and down three or four times; drain it, but not too closely; when in the frame, place upon the back a piece of common blotting paper to absorb moisture, the two lower silver wires should be covered with slips of blotting paper; the sooner it is placed in the camera the better.

6.—The time of exposure can only be ascertained by practice—no rules can be laid down—and I am unacquainted with any royal road, but that of experience, leading to constant success in this most important point.

7.—The plate having been taken from the camera, and placed upon a levelled stand, or held in the hand, develope immediately the latent image with the following solution :—

Pyrogallic Acid, 3 grains.

Distilled Water, 1 ounce.

Acetic Acid, (glacial) 1 drachm—Mix.

Take one part of this solution and two parts of distilled water for use. The Pyrogallic solution made with proper Acetic Acid, and of the above strength, may be kept for a month or more in a cool place. Nevertheless, if the conditions of light and situation are unfavourable, I should prefer this solution just made.

8.—When the image is sufficiently intense, wash freely with common filtered water; then pour on a saturated solution of Hyposulphite of Soda, which should immediately remove the Iodide of Silver: wash again well with water; allow as much as the plate will hold to soak in for at least half an hour, to remove all traces of Hyposulphite; lastly, wash the plate with a little distilled water, stand up to dry, and if required varnish with amber varnish. The varnish I prepare adds very much to the blackness of the negative; this is made evident by varnishing half the plate only.

NOTES.

1.—To produce a good printing negative with a *single lens*, it is advisable that the sun should be upon the object, or else it must be very well lighted, and in the open air. Landscapes generally want in breadth and artistic effect when taken without sun, the charm-

ing effects of light and shade are absent, the whole picture being generally flat and misty; there may, however, be a few accidental exceptions to this rule.

2.—In cases where it is desirable to add to the intensity of the negative, a few drops of the bath may be mixed with the developing liquid towards the end of the development.

3.—All stains on the hands, linen, &c., may be removed by Thomas's Cyanogen Soap, which should be applied without water at first, then thoroughly washed off. To assist the operation, the hands may be now gently rubbed with a fine piece of pumice stone, when the stains quickly disappear.

4.—Glass Baths are preferable to Gutta Percha for Solution of Nitrate of Silver. A large assortment, of a superior kind, may be seen at No. 10, Pall Mall.

5.—In using Amber Varnish, before pouring it off, keep the plate horizontal a few seconds—this gives time for soaking in, and prevents the formation of prismatic colours arising from too thin a coating.

6.—Rub the lenses frequently with a soft and clean wash leather; the rapidity of action is much influenced by the brightness of the lenses; their surfaces are constantly affected by moisture in the atmosphere, which, condensing, destroys the brilliancy of the image.

7.—Bear in mind that, as light is the producing agent, so will it prove a destructive one; not less than four folds of yellow calico should be used to obstruct white light; and in that case the aperture covered should be no larger than is necessary to admit sufficient light for working. This remark particularly applies to the Collodion process.

8.—The white blotting paper commonly sold for Photographic purposes is not suitable for filtering the solution; that only should be employed which is used by chemists for delicate chemical operations. Filtering paper for Nitrate of Silver Bath, &c., &c., may be procured at 10, Pall Mall.

9.—HYPOSULPHITE OF SODA.—A great deal of rubbish is sold under the name of this salt; as a test of its quality, $1\frac{1}{2}$ drachm should entirely dissolve in one drachm of water, and this solution should dissolve rather more than $4\frac{1}{2}$ grains of Iodide of Silver.

10.—CHEMICALS.—The purity of Photographic Chemicals cannot be too strongly urged—the cheapest are not always the most economical. The commercial preparations are generally not to be depended upon, as these, though perhaps unadulterated, are, strictly speaking, not chemically pure. It is best to procure them from well known chemists, who understand the purpose for which they are intended, and make the preparation of these substances peculiarly a branch of their business.

11.—Never leave chemical solutions exposed in dishes; when done with, pour them back into glass stoppered bottles and decant for use from any deposit, or filter if necessary.

12.—In all Photographic processes it is absolutely necessary to be chemically clean; and this sometimes is not easy; as a rule, never be satisfied with cleanly appearances only, but take such measures as shall ensure the absence of all extraneous matter in preparing the solutions, cleaning the glasses, dishes, &c.

HINTS.

1.—When working with a double lens in the open air, or in situations where there is much light, the full aperture of the lens being used, it is necessary to provide against the action of diffused general light which, under these circumstances, enters the lens, destroying the brilliancy and intensity of the image—in fact acts chemically over the plate; thus giving a muddy, flat, or otherwise imperfect picture—an appearance corresponding to the fog produced by some Collodions. This general action of diffused light, during the exposure of the plate in the camera, interferes subsequently with a prolonged or even necessary development. My attention was drawn more particularly to this fact, from the circumstance of having to make alterations in my glass room for the purpose of obtaining twice the amount of light; when completed, I was quite unable to take a picture, simply because the extra light introduced, although a north light, interfered with the darkness necessary for the production of clean and vigorous pictures in the camera. The remedy for this is simple: I screw on to the front of my camera a sliding dark box, open at the end. I can, by this means, regulate the amount of protection according to circumstances, viz., from twelve to twenty-four inches; brilliant and intense negatives are thus obtained with great rapidity. Now remove the protector, and the reverse is evident; the picture is flat, faint, shows a want of detail, and a general tendency to blacken over under the influence of the developer. Cameras constructed on the above principle can be seen at Mr. THOMAS'S. It is obvious that this arrangement is very valuable for portrait cameras.

2.—Under all circumstances, when Collodion is used, throw a large black cloth over the slide when placed in position, and if the camera has a sliding front, let the black cloth hang a few inches over the front of the camera, before drawing the shutter; now put the left hand underneath the cloth, place this on the top of the slide to keep it in place, and with the right hand outside feel for the leather tongue; pull up the cloth and shutter together; the cloth should not be removed until the slide has again been closed; this sufficiently indicates the necessity for preventing ever so slight a ray of light attacking the plate during the exposure. N.B.—First-rate pictures cannot be obtained in the open air, unless this precaution is taken.

3.—Use as little light as possible in the dark room; the quantity must be regulated by the aspect of the window through which the yellow light is admitted. A candle would entirely spoil a Collodion plate, unless protected by means of a yellow calico shade.

4.—Condition of Collodion best suited for different purposes:—For portraiture with a double lens, mix the Collodion twelve or twenty-four hours before it is required for use; the picture thus obtained is more intense than when Collodion recently mixed is used. For works of art and still objects, &c., Collodion a week old is best; and for landscapes, a greater general intensity and sufficient rapidity of action is obtained when the Collodion has been mixed a fortnight. For black and white objects, *i. e.* engravings, &c., use Collodion a month old.

5.—Collodion in hot weather may become too thick to use conveniently; it should then be slightly diluted with a mixture made of three parts æther and one part of absolute alcohol of known purity, and well shaken.

6.—I find that spots upon the plate are more apt to be produced when the Nitrate of Silver Bath is surcharged with Iodide of Silver; hence it is evident that a plain solution of Nitrate of Silver (30 grains to 1 oz. of water) added to the bath occasionally, tends very much to the removal of this annoyance. Excursionists should iodize their Collodion three or four days before starting, and decant into a clean bottle three-fourths for use.

7.—THE CAMERA DESCRIBED.—A good and well-made Camera is more or less useful in proportion to the skill bestowed on its construction, The best seasoned wood and most accurate measurements are necessary; moreover, every part must be easily under command. A Camera should be made on the most simple principles; all unnecessary complication of screws and joints avoided. Let *strength, simplicity,* and *correct* workmanship be the primary considerations. For the Collodion process, I prefer a plain sliding trunk Camera, half the bottom board hinged to turn up—thus forming a box in which to pack and carry some of the necessary apparatus; a stout handle can be screwed to the top, and you have at once an efficient travelling *multum in parvo*. The Camera should also have a sliding front, by means of which the lens is made to move vertically for the purpose of cutting off foreground—an arrangement at times desirable when other portions of the picture are of

more importance. The piece of ground glass upon which the image falls must be finely ground plate; and if an upset or smash occurs, take care, in replacing, that the *ground* side faces the *inside* of the Camera. Double paper holders are most convenient for the paper processes; these slides are hinged and open in the centre; the sensitive papers are then placed face downwards upon the glasses, and shut up back to back, with two pieces of blotting paper between them. The slide for Collodion is, of course, constructed on a different principle; it contains a frame to hold the collodionized glass, which rests upon silver wires inserted diagonally at each corner; the loose frame is hollowed out to prevent the wood coming in contact with the wet silvered plate. A very slight imperfection in the Collodion slide, sufficient to admit an infinitesimal ray of light, would have a damaging effect upon the beauty and perfection of the negative picture.

THE LENS.—GENERAL REMARKS.—It is a mistaken economy to purchase cheap and inferior lenses: if Photography is worth doing at all, it is certainly worth while to do it well. A good lens is the Photographer's *sine quâ non*. The double combination is used for portraits, and in all cases where great rapidity of action is desirable. These lenses do not cover a large surface, but the size of the picture may be increased, if the time of exposure is immaterial, by making use of smaller stops, even to the size of half an inch in diameter. At times, such an arrangement with the double lens is useful. A lens which covers six by five inches can thus be made to give a picture sharp to the edges eight by six inches, or even more.

Reduced copies of oil paintings are advantageously made with a double lens and small stop.

The single lens, or orthographic lens, is used for landscapes and copying still objects, and works of art generally. It is furnished with different stops; when the object to be taken is well lighted, the smallest may be employed; but for masses of dark foliage, &c., the larger stop should be made use of. A little observation and exercise of judgment will soon determine the operator in the use of his stops. The rack and pinion movement to the portrait lens is desirable, as it can be readily reached with the hand, for the purpose of getting the sharpest focus. I consider that this addition to the single lens is unnecessary, owing to its greater focal length, which makes the rack and pinion movement inconvenient to use. A perfect focus can always be obtained with a well made sliding Camera.

I would say to all who appreciate this art for its great usefulness and numberless appliances, never be content with any but the best results; the practised eye soon gets accustomed to detect flaws and imperfections, arising in some instances from the use of bad tools. The Connoisseur in Photographic matters has now become fastidious, and ceases to admire a Photograph for the interest attached to its wonderful production; apart from this, in the advanced and perfected state of the art, correct drawing and pleasing realizations of natural objects are looked for; and surely we may expect that, after fifteen years and more of up-hill labour, this young giant of science will stride rapidly onwards, destined, even yet, to take a much higher position as an important and advancing art.

ON THE PREPARATION

OF A

NORMAL NITRATE OF SILVER BATH.

The quantity of nitric acid wrapped up in the interstices of crystals of nitrate of silver varies very much, and of course according to the degree of acidity of the solution from which the crystals are formed. My attention has been given to this subject; during my investigations I have found a method of not only preparing a nitrate of silver bath in the normal state, but also of correcting an old and useless bath which may have become acid, either from being kept in gutta-percha vessels, or from the liberation of acid arising from the decomposition caused by old collodion. The process is as follows:—It is assumed that all crystals of nitrate of silver contain nitric acid in a greater or less degree; fusing, to get rid of its presence, is a clumsy and objectionable method, for it is difficult to fuse nitrate of silver, even in very small quantities, with a view to perfectly driving off the free nitric acid (for which the crystals have a great attraction) without producing a new decomposition or contamination; the object, therefore, is to render inert this free nitric acid. The alkaline carbonates have been suggested: this method, to my mind, is very objectionable; in the first place, a new compound is introduced, carbonate of silver; secondly, if too much of the alkali be added, the strength of the silver bath is impaired; it is also not unlikely that triple salts are formed. The most

simple, and therefore the best plan, and one which I find answers invariably, whether the bath be old or new, is to add to the prepared silver bath a small quantity of freshly precipitated oxide of silver; the free nitric acid seizes upon this with avidity, and forms at once nitrate of silver (nitrate of silver being a nitrate of oxide of silver); it matters not whether just sufficient of this oxide be added or a large excess; if the latter, the strength of the bath is not impaired, the undissolved excess being simply left upon the filter. Having treated the bath in this way, it is in an alkaline state, and no picture can be taken with it; fortunately, however, its condition is perfectly normal, for the water which dissolves the crystals of nitrate of silver, dissolves also a specific and homœopathic dose of the oxide used, hence the alkaline re-action. It now becomes a nice point to act upon this atom of oxide with nitric acid: in the first place, the excess of undissolved oxide of silver must be separated by filtration, and to the bright filtered solution add $\frac{3}{4}$ ths of a minim of nitric acid, sp. gr. 1.50 to 200 ozs. of the bath; this quantity is sufficient to correct the alkalinity produced by the presence of oxide of silver dissolved in the water of the bath, and at once, as if by magic, a most perfect picture can now be produced: the sensitiveness of the bath is ensured by the known quantity (being minute) of the acid added.

I consider that the presence of this acid, when it can be so nicely calculated as now described, is far less objectionable than the excess of acetic acid sometimes used, this latter being more volatile, and the attraction for nitrate of silver not so strong. The

bath, when acetic acid is added to correct the oxide is liable to change from a possible liberation of this acid, due to a want of a powerful affinity for silver, which it fails to possess; whereas the nitric acid now recommended, however small the quantity present, is with difficulty got rid of. The object of this paper is, therefore, to establish these facts:—1st, It is best to employ fine and pure crystals of nitrate of silver for preparing the bath; 2nd, To get rid of the excess of acid wrapped up in their interstices by adding to the solution sufficient, or an excess of oxide of silver; 3rd, That the bath so prepared is in a normal condition; 4th, To render it efficient and in working order, $\frac{3}{4}$ ths of a minim of nitric acid, spec. grav. 1.50 must be added to every 200 ozs. of the filtered nitrate of silver bath to neutralize the oxide dissolved by the water; 5th, It is very evident that, having corrected the nitrate of silver bath with the oxide, the undissolved excess must be filtered away before adding the specified quantity of nitric acid; 6th, All nitrate of silver baths that have simply become acid and have not been tampered with by other means, can at once be restored by first rendering them normal by means of oxide of silver (freshly precipitated), then filtered, and the stated quantity of nitric acid added. In corroboration of this statement, I have lately got together as many baths as possible that were comparatively worthless, and by this process have rendered them perfect, except in cases where alkaline carbonates and acetic acid have been added. I am therefore led to suppose that triple salts may be formed in this latter case, and if so, they are no doubt a certain

source of instability. This is however, merely conjectural; I have not sufficiently examined the subject to speak with confidence; the question is not now of much practical importance. 7th, I consider that test papers are worthless for indicating either the acidity or alkalinity of the bath. 8th, It is necessary to remember that the oxide of silver must be added in the moist state: I prepare both this oxide and acid of the required strength, by the use of which all photographers may at pleasure start as it were anew, by bringing their bath first into a normal condition and then adding the acid corrective.

OBSERVATIONS

IN REFERENCE TO THE STATE OF THE

NITRATE OF SILVER BATH,

AND ITS ACTION UPON

COLLODIONIZED PLATES.

THE ALKALINE NORMAL BATH, WHEN FILTERED FROM EXCESS OF OXIDE.—The plate when developed gives a brownish red film, streaky, dirty, and greasy in appearance; the image shows through this film in parts very faintly, *i. e.* it is only just discernable; the developer flows over the plate very easily.

THE BATH WITH AN INSUFFICIENT QUANTITY OF NITRIC ACID AS A CORRECTIVE.—The plate when developed gives at first indications of a perfect picture, but with a suspicion, of full exposure; the proper and gradual growth of intensity does not, however, take place; the half-tints in deepest shadow are rendered, and show simultaneously with the high lights; a flat, poor, and feeble image is the result; if the subject be landscape, the sky is faint, transparent, and streaky; the exposure in the camera may have been very short, and under this condition of the bath, perhaps half the legitimate exposure gives the result described.

THE BATH WITH A PROPER QUANTITY OF NITRIC ACID AS A CORRECTIVE.—The image springs out shortly after the developer is poured on: first, of a brightish red colour, the highest lights being from the first well defined; the growth of middle tints next becomes discernable, the parts in deepest shadow show next in rotation, the whole picture being evident before increase of intensity takes place; this now goes on gradually until an unmistakeable harmony pervades the whole; the brilliancy of the picture is well preserved, and no sign of fogging exists. If the exposure has been well timed, there is not much fear of over-development. The intensity of sky is good, and uniformly opaque: when viewed by reflected light, the negative whilst wet, presents a rich and brilliant positive appearance; when dry, this image is more difficult to see, but should not have any cloud over it, the rich creamy and blue colour giving place to a surface of almost silvery radiance.

THE BATH WITH AN EXCESS OF NITRIC ACID.—The image appears in parts of the plate only, and that with great difficulty; the black deposit is very transparent; it is altogether most evident that the deoxidizer (pyrogallie acid) acts inefficiently, the decomposition of the nitrate of silver being checked by the presence of nitric acid in excess; under these circumstances no amount of exposure in the camera compensates for acidity of the bath; the developer flows with difficulty over the plate.

THE BATH UNDER SOME CIRCUMSTANCES REQUIRES THE ADDITION OF AN ACID.—The indications are, of course, those stated in the second paragraph. In hot

weather it is very desirable to add a drop of the dilute acid to every half-gallon of the bath; I find also that when testing and experimenting with collodion *just iodized*, after immersing a dozen plates, a slight alkalinity is evident—to an extent not absolutely injurious—but nevertheless is discernable by a falling off in brilliancy of the negative; add a drop of the dilute nitric acid, and all again goes well. No alkalinity is discernable when collodion a day old is employed.

NOTE.—I find it convenient to use a dilute nitric acid in performing the above operations; when drops are spoken of in these observations, this dilute acid is meant.

In my paper above, I make reference to nitric acid for correcting, sp. gr. 1.50. Acid of this strength is frequently met with in commerce; my object, therefore, in taking this acid as a standard of strength is sufficiently obvious: first, to show the exceedingly minute quantity necessary to produce the desired effect; and secondly, for the convenience to be derived from making reference to nitric acid of usual strength. It might, however, appear to many, not desirous of taking the trouble to calculate fractions of a drop, that the correction required for 10 or 20 ozs. of the bath must be attended with some trouble. In order to meet this difficulty, I subjoin the following alkali and acid formula:—

ALKALI (oxide of silver in a moist state), ACID (dilute nitric acid containing one per cent. of real acid). Treat the bath, as described, with the oxide of silver; filter from the excess, and add to each 20 ozs. of this filtered bath five minims of the dilute nitric acid.

It may not be out of place to conclude with a few general remarks worthy of consideration when absolutely perfect negatives are desired :—The sliding body of the Camera should undoubtedly be lined with black cotton or silk velvet. I prefer the latter, the black dye of silk being more permanent ; to the eye of a close observer the fog produced by diffused light from the surfaces of the usual black stain used for the inside of cameras is very evident ; single lenses under very many circumstances should be protected as much as possible from reflected light, entering the tube of brass-work, by means of a shade over the upper portion of the tube ; this helps to prevent solarization of the sky. The shade need not project beyond four inches ; a piece of brown paper and string answer the purpose.

To prove the necessity for this precaution, focus a landscape, withdraw the ground glass, throw the velvet over your head, and look into the camera. A considerable quantity of light will be perceived on the lower surface of the lens tube ; place a shade over the upper portion of the tube, and the extraneous light will vanish. All rays of light that do not actually emanate from the object to be copied ought to be dispensed with, when brilliancy of image is aimed at. It cannot be too frequently urged that the velvet cloth must be thrown over the slide when in position, before pulling up the shutter ; and also that this should be large enough to extend somewhat over the rigid portion of the camera, in order to prevent light entering the sliding body.

I would remark in conclusion, that experiments with ordinary double lenses of short focal length are, comparatively speaking, worthless for testing the actual value of photographic preparations or processes; the results obtained on small plates are also not sufficiently conclusive. In order to arrive at a full and satisfactory conclusion, when working either for the purpose of chemical investigation in photography, or with a view to establishing the value of any process, plates not less than 12 by 10 inches should be used, and a single lens of 20 inches focal length, with not more than half an inch aperture. I have for some time past adopted this course, and have found in every respect the indications more valuable and instructive.

F O R M U L A

FOR THE PREPARATION OF THE

NITRATE OF SILVER BATH.

Into a 20 oz. stoppered bottle put

Nitrate of Silver, $1\frac{1}{4}$ ounces,

Distilled Water, 4 ounces—dissolve.

To this solution add

Iodide of Potassium, 4 grains,

Dissolved in 1 drachm of distilled water,

Mix these two solutions; the precipitate (Iodide of Silver) thus formed is, by shaking, entirely dissolved. Add 16 ounces of distilled water when the excess of Iodide of Silver is again thrown down, but in such a finely divided state as to render the saturation of the bath with Iodide of Silver perfect. Now drop in sufficient of the Oxide of Silver to turn the turbid yellow solution a dirty brown colour; so long as this effect is produced the quantity of Oxide of Silver, however much in excess, is of no consequence; shake the bottle well for 10 minutes or so at intervals, then add Alcohol, 30 minims and filter; to the filtered solution add Dilute Nitric Acid of the strength stated, 5 minims. The bath is now ready for use, and should be quite neutral.

26

A FEW

REMARKS

IN REFERENCE TO THE VARIOUS

COLLODIONS AND IODIZING SOLUTIONS

I NOW PREPARE.

THESE COLLODIONS

ARE USED EXTENSIVELY AT ALL THE

PRINCIPAL

PHOTOGRAPHIC ESTABLISHMENTS

AND BY THE MOST

DISTINGUISHED PHOTOGRAPHERS

BOTH AT HOME AND ABROAD.

THOMAS'S
NEGATIVE COLLODION,
WITH USUAL IODIZER.

In the hands both of the amateur and professional photographer, I believe that no preparation has been found to give such uniform and perfect results, I therefore recommend this Collodion with its Iodizer for all general purposes, and especially for landscapes, works of art, &c.; when Iodized it undergoes a slight but slow change indicated by the colour it assumes after keeping; this property may be turned to good account by the professional photographer, who will readily adapt this variability of condition to his numerous requirements; for example, when Iodized a month and decanted from any deposit before use, nothing can surpass the beauty of the results obtainable for landscapes or objects of art, and still life in general, especially when lenses of small aperture and long focal length are used. After being Iodized two or three months it is excellent for engravings, maps, &c., and various modifications of quality and intensity, may be extemporized by mixing this preparation newly Iodized, with the same kept Iodized for various periods of time. When required for portraiture it may be used at once, but after a few hours mixing it works cleaner. If kept in the operating room or at any rate not exposed to strong light this Collodion when Iodized suffers very little loss of sensitiveness for a month or so. No alkalinity of the bath is produced by its constant use.

T H O M A S ' S NEGATIVE COLLODION, WITH CADMIUM IODIZER.

Many operators prefer this Iodizer: the Collodion when Iodized with Cadmium maintains a uniformity of sensitiveness, and undergoes very little alteration of properties. As a rule, however, Collodion Iodized with Cadmium does not flow so freely over the plate. To the accomplished photographer this mechanical objection is not an obstacle to its use. No alkalinity of the bath is produced by the use of Cadmium Iodizer.

T H O M A S ' S IODIZED NEGATIVE PORTRAIT COLLODION.

This Collodion is prepared especially to meet the requirements of numerous professional friends; it is not calculated to give a negative quite so intense as that given by my usual preparation of Collodion for negatives; the high lights and middle tints come out uniformly, without solarization of the former, producing much harmony and softness, with a proper degree of roundness, which expresses exactly the appearance and condition of a good untouched photographic portrait.

I do not make this Collodion in two solutions; it will retain its sensitiveness for a year or two, and, by keeping, becomes peculiarly bright, giving a film free from any impurity.

THOMAS'S
TREBLY IODIZED NEGATIVE
COLLODION.

Some operators prefer a very highly Iodized Collodion, the film appearing as opaque as yellow paper when taken out of the bath. This Collodion is prepared with Pyroxiline of a very high order, it will keep Iodized without loss of sensitiveness for two or three years, it is most excellent for masses of dark foliage or interiors and badly lighted subjects; it will bear a very long exposure in the camera without drying, and is sometimes used (mixed) in various proportions with my other preparations of Collodion; such a mixture proving at times most advantageous.

THOMAS'S
POSITIVE COLLODION.

I have a few remarks only to offer on the properties of this Collodion: it gives a faint image by transmitted light, which image is preserved on the surface of the film when developed with the Salts of Iron. Each operator will select for himself the bath and developer best suited to his taste and experience. I recommend a plain solution of Nitrate of Silver, 30 grains to 1 ounce of distilled water, with a drop or so of Acetic Acid, to each pint of the bath; it is necessary to allow a little time for the film to set before immersion. The time will vary from ten seconds to forty seconds, ac-

according to the condition of the atmosphere. The purity of the Nitrate of Silver is of the utmost consequence for the preparation of a bath, but especially so, when required for positives direct. The following are good positive developers:—

Protosulphate of Iron, 15 grains

Strong Nitric Acid, 5 minims

Alcohol, 1 drachm

Distilled Water, 1 ounce

OR,

Protosulphate of Iron, 20 grains

Glacial Acetic Acid, 20 minims

Strong Nitric Acid, 2 minims

Alcohol, 1 drachm

Distilled Water, 1 ounce

Positive Collodion is preferred by some, Iodized a month or two.

THOMAS'S

COLLODION FOR DRY PROCESSES.

The best pictures that I have seen on dry plates were made by using a mixture of three parts of my Iodized negative Collodion with one part of my Iodized positive Collodion, mixed a month before use. This mixture is suitable for any of the dry processes.

THOMAS'S
NEGATIVE COLLODION,
WITH MAGNESIUM IODIZER.

In accordance with the wishes of some of my patrons, I have been induced to prepare the above special Iodizer. Some years ago I made several experiments with the various Iodides, including that of Magnesium; I did not then see any advantage to be derived from its use over that of my usual Iodizing Compound, on the contrary, by degrees it made the bath slightly Alkaline, and although its extreme solubility rendered it very attractive as an Iodizer, I at once saw that, in the hands of an inexperienced operator it might be productive of disappointment. Collodion, when Iodized with the salts of Magnesium, does not undergo a very rapid change; it has been stated that it keeps well any time. I do not, however, credit this statement, and believe the error to have arisen from the fact, that, up to the present date, January, 1860, these preparations of Magnesium, Iodide and Bromide, have not been prepared absolutely pure for sale. The samples I have met with are not completely soluble in Alcohol, the Iodide containing much uncombined Iodine; the impurities I allude to have, I believe, been produced by injudicious fusing, a delicate but necessary operation when deliquescent salts are to be preserved; both the Bromide and Iodide of Magnesium should dissolve perfectly in Alcohol, without producing the slightest turbidity. I admit that it is no easy matter to prepare these salts pure, but having now done so to my

own satisfaction, I am able to state clearly the properties of Collodion Iodized with them. As I before remarked, a very slight Alkaline re-action is produced with these Magnesium salts in a neutral bath; when the Collodion has been Iodized a month or two this is not evident; the Alkalinity is most readily corrected by the addition of two or three drops of Acetic Acid to the pint of bath. This may of course be used either as a preventive, by adding it at once to the bath, or, as a corrective, when rendered alkaline by the use of this Iodizer.

I have not the least hesitation in saying that perfect pictures, with marvellous half-tones, may be obtained with this Collodion in half the ordinary time of exposure when used in conjunction with Iron as a developer, and under circumstances which would preclude the possibility of obtaining a good picture with any other Collodion, even if used with the same developer. Collodion Iodized with Magnesium Iodizer, and put by to settle for a month, works brilliantly clean, with the slightly acid bath as above described, and which, by the bye, should be always kept in glass, and used only for this Collodion. I can recommend especially the use of this Iodizer when the plates are to be developed with iron. The following formula is a good one—

Protosulphate of Iron, 8 grains
 Glacial Acetic Acid, 10 minims
 Alcohol, 20 minims
 Distilled Water, 1 ounce

In dull weather, the Iron Developer may be used with advantage, and a saving of time effected in the

exposure; the intensity of negative is not so great as when Pyrogallic Acid is employed, with which this Collodion answers admirably.

NOTE.—All the preparations of Collodion now described (excepting that with Magnesium) may be used with a neutral bath, without producing alkalinity or decomposition.

Many useful variations of intensity and softness of half-tone may be produced *to suit the operator's requirements, by mixing the various preparations of Collodion I now manufacture.* It is difficult to lay down rules for these modifications. I can only compare the results obtainable to the varied and numerous blendings of shades of colour, which the skilled artist is capable of producing by a judicious admixture of three or four pigments he coaxes together on his palette, and which he deems necessary for the proper treatment of the particular subject he may have in hand.—As a rule, the first mentioned Collodion in my list (my well known preparation) gives the greatest amount of intensity; the positive Collodion, the faintest image. Any of these preparations may be mixed together (but not that Iodized with Magnesium) without any decomposition being produced in Collodions so mixed, or deterioration of the Nitrate of Silver Bath.—For example, it is required to take a landscape with masses of dark foliage, and a white house: in order to treat this subject in the best manner, I should recommend a mixture composed of two parts of my regular preparation of Iodized Negative Collodion, (Iodized a fortnight or

so,) and one part of my Iodized Negative Portrait Collodion, well shaken together, and allowed to settle, then decanted. This mixture will retain its sensitiveness a considerable time. I can conceive it quite possible to give to a photographer's works an individuality to a certain extent due to a judicious combination of Collodions such as I have indicated. With reference to the uniformity of the preparations I now recommend, I can take upon myself the responsibility of this condition to success; my conveniences for the manufacture of Collodion are now most perfect and numerous; the watchful care and attention I have given to the manufacture of the various substances employed, extending over a period of ten years, place me in a position to speak of these preparations with confidence. I now offer them to photographers, with a sincere wish to advance this favourite art in the estimation of its numerous votaries and admirers.

TRADE MARKS TO PREVENT EITHER FRAUD OR ERROR,
OVER EACH STOPPER.

Thomas's Negative Collodion.....	RED LABEL
„ with Cadmium.....	BROWN LABEL
	(Over Iodizer)
„ with Magnesium.....	GREEN LABEL
	(Over Iodizer)
„ Iodized Portrait Collodion	YELLOW LABEL
„ Trebly Iodized Negative Collodion..	VIOLET do.
„ Positive Collodion.....	BLUE LABEL

DIRECTIONS

FOR

CLEANING THE GLASS PLATE.

It is not at all an uncommon thing to hear that Collodion gives spots, stains, streaks, and sundry other cutaneous affections to which "the children of the sun" are said to be peculiarly liable; very much, however, is erroneously attributed to the Collodion which more properly and with greater justice should be ascribed to want of cleanliness and method in cleaning the plate. Nothing is so easy; and although there are many ways of arriving at this very desirable end, I unhesitatingly recommend the following as most efficient, safe, and simple. Cleaning the plate is of much greater consequence than some are prepared to admit. Every photographer should make himself thoroughly acquainted with this process: much time, expense, and subsequent labour will be saved by a systematic attention to what may at first be thought sheer drudgery, and which is too often delegated to inexperienced and careless hands. I am not saying too much when I state that, in point of manipulation, cleaning the plate is the key to the whole position. I now proceed to describe, for the benefit of those who can fit up their operating-room with conveniences, the plan I adopt.

I have a shallow sink, three inches deep, lined with lead, and a pipe to convey away the waste water (the size of this sink must, of course, be regulated by the size of the plates to be cleaned); it is firmly mounted on a stand of convenient height, and securely fixed to the wall of the room; in this sink I place two blocks of deal ($1\frac{1}{2}$ inch stuff) a little larger than the plate, covered with thick felt strained over one side of the block and nailed to the edges all round; over this in the same manner I strain white calico; the blocks are now prepared, and present a firm but sufficiently soft surface on which to cleanse the plates; place them in the sink and wedge up tight with loose wedges. I use one of these blocks for the first operation. Place the plate to be cleaned in the centre of the block, and pour on to it a small quantity of the following mixture:—

	OZS.
Prepared Tripoli	2
Water	$3\frac{1}{2}$
Spirits of Wine	4
Solution of Caustic Potash	$0\frac{1}{2}$

Take a tuft of cotton-wool and rub the plate well and firmly over with the above mixture for a minute or so; then remove the plate to block No. 2 (over this I have fixed a tap of water a few inches above the plate); turn on a gentle stream and rub off the tripoli mixture with a second tuft of cotton-wool. Keep these tufts upon their respective blocks; they are then always ready for use. Be very careful to rub the edges of the glass with the tuft, to remove particles of Tripoli which become attached to the roughened

edge, and which, if not removed, will give a prolific crop of spots on the picture. Having washed off the Tripoli, plunge the plate into a deep dish of water, and there let it remain until six plates or more have been in like manner cleaned; then take each out singly, again wiping the edges with a tuft of cotton, and pass each plate through a dish of distilled water. Do not set up more than six at a time to drain; when six have thus been treated, commence drying off the first set up. The plates must not be allowed to become dry before rubbing with the cloths. In order to dry them quickly and effectively, place upon the table a piece of felt or ironing-blanket, over which spread one of the cloths (washed in clean water without soap); place the plate upon this, and rub it well on both sides with another cloth doubled up so as to form a pad. One side of this plate should be marked with a diamond, and upon this marked side the greatest care should be bestowed. The plates, so far cleaned, may be stowed away in a box; before use, however, the final rub must be given, to remove all superfluous moisture; this is best effected by two wash-leathers previously purified by washing and rinsing them freely in water for two days or so; they must be allowed to dry spontaneously. Lay the plate upon one of these leathers, and rub it well on both sides with the other leather doubled up so as to form a pad. Breathe occasionally upon the plate whilst rubbing; this tends to equalize the moisture. Rub, lastly, with a well-washed silk handkerchief. Even now, some small particles of fibre may be left from the cloths, and these attach themselves very tenaciously to

the glass; in order, therefore, to remove these enemies to an absolutely pure plate free from "comets," I take a flat and broad camel-hair brush two inches wide and pass it firmly over the plate just before pouring on the Collodion. This brush must be most carefully prepared for the purpose, by soaking it in water for two or three days, and rubbing out all dust and extraneous matter with the fingers; it must then be suffered to dry spontaneously, and kept free from dust in a card-board box; if this cleansing be neglected, more impurities will be added to the plate than removed from it.

I have been at some pains to describe clearly a systematic method of plate-cleaning, feeling certain that the necessity for carefulness in this process is not sufficiently attended to. I am sure that nearly all "comets" and other abominations arise from the imperfect removal of fluff and fibre from the plate. These minute particles are not seen until draining off the Collodion; they then show themselves in the form of nuclei, checking the Collodion in its course, and, what is very much to be avoided, contaminating the Collodion, which becomes full of floating particles, and thus prevents the possibility of getting clean plates until the Collodion has again been allowed to settle; if, therefore, it is required to make experiments only, without regard to the purity of the result, keep a bottle of Collodion for this purpose.

When working at home with all the conveniences described at hand, plates used (if the picture is not approved of) may be at once placed in a dish of

water ; the film then floats off and carries with it all impurities ; simple washing and drying as described are then sufficient. New plates must always be put through the whole process, and also those which have become dry with films on.

A perfectly clean glass shows little or no irregularity on the surface, when breathed upon, having then very much the appearance of ground glass, and, if properly dried, the moisture flies off rapidly. Collodion flows easily and freely over a well-cleaned and dry plate, presenting a surface free from irregularities, either before or after the action of the nitrate of silver bath.

The practice of cleaning glass plates with detergents, said not to require subsequent washing, is one fraught with great risk and full of objection ; it is impossible to get rid of fixed alkalies or salts by mere friction with a cloth without washing. I allude to this method of cleaning (?) because I know that it has been a cause of much trouble to many who have for a time adopted the plan ; moreover, it is *by this process* impossible to remove the Tripoli from the ground edges of the glass.

HOW TO VARNISH THE NEGATIVE.

This subject is deserving of careful attention; at the same time, all that can or need be said concerning it may be stated very plainly and in a few words.

I will endeavour to explain and comment upon the two methods now in use, and will distinguish them by the terms "hot" and "cold." I apply the first term, hot, to the process making the warming of the plate necessary previous to pouring on the varnish, which is applied whilst the plate is still warm. This method is very generally followed, notwithstanding the inconvenience of heating the plate—for the reason that the coating left upon the surface is perhaps harder than when cold varnish is applied, and consequently stands a greater amount of rough treatment: no doubt a desideratum. Ordinary spirit varnish, whether French or English, contains a certain amount of water; that is to say, the spirit generally used is not absolute. A more fluid, and consequently a better varnish, can, I think, be made with absolute alcohol—at least, such is the result of my experiments; but whatever strength of spirit is used, the effect of all spirit varnishes, more or less, is to interpose between the image on the surface of the negative and the prepared surface of the paper, a layer of gum more or less thick. I need hardly say that any intermediate film must prevent absolute contact of these surfaces and consequently detract somewhat from the sharpness of the picture.

There can be no very great mystery as to the composition of spirit varnishes when it is considered that the gums we have to select from are not numerous; viz. copal, animi, sandarac, thus, mastic, lac, and dammar; these gum resins have, however, various properties, some being harder and more vitreous than the others, whilst some are sticky and resinous. It is therefore very desirable to make use of both these qualities by selecting and combining judiciously such of the gums just enumerated as shall give a varnish possessing hardness and durability, with sufficient elasticity. The hardest gum cannot be used alone, but must be mixed with others more resinous. I find that a mixture of the three first on my list answers the conditions just laid down, if absolute alcohol with a small per-centage of chloroform is used for the solvent. This varnish has proved, in my hands, the best of the spirit varnishes. I have heard it remarked that this, and no doubt other strong spirit varnishes, occasionally have a very unhappy property of removing the image from the negative; I must say that I have never been able to produce this undesirable result myself, and think that perhaps such an action may have been due either to moisture in the film, unequal application of heat to the plate, imperfect washing-out of the hyposulphite of soda or cyanide, or to some rottenness or peculiar condition of the film of collodion. The advantage and disadvantages in the use of spirit varnish may be briefly stated: in its favour, a greater hardness of coating; against it, the inconvenience of having to heat the plate, and loss of sharpness in the positive

from the interposed film of gums left upon the surface of the negative. Having disposed of what I have termed the hot process, it only remains to draw attention to that designated "cold." It is not my intention to enumerate the various solvents and gums which are or might be used for the manufacture of cold varnishes. I have tried many of them, and find that all are, more or less, tacky when dry.

I shall confine myself to a few words descriptive of the best cold varnish, which, unquestionably, is that made by dissolving amber in chloroform. Many will be surprised to hear that such a thing as a package of fine amber seldom, if ever, finds its way to this country; but plenty of a very inferior and rough description is to be met with. The finest kind is used for making the mouthpieces of pipes, which are, I am given to understand, of foreign manufacture. Having learnt this much, I set to work to obtain, through my drug merchants, some further information on the subject, and was fortunate enough to find out the holder of a large quantity of the chippings from the fine pieces of amber, which he had been provident enough to store away. This is not a coarse powder of amber, but unmistakeable chippings, cut as with a sharp instrument, bright and clear in quality, in every respect equal, for making varnish, to the fine and most costly pieces, of which indeed these chippings are a portion. With such a sample as this there is no difficulty in producing a varnish in every respect desirable for photographic use, and sufficiently hard to withstand any friction the surface of a negative is likely to meet with. The coating left upon the negative is perfect,

and can hardly be distinguished from the patent plate: this varnish penetrates the film, and adds very much to the beauty and clearness of the negative, at the same time leaving upon the film the thinnest possible coating, thus admitting of the most perfect contact with the excited paper.

I have had opportunities of examining some hundreds of negatives, produced by various operators both amateur and professional, many of which were more or less disfigured, if not damaged, by the varnishing operation. My method of using the amber varnish is as follows. I invariably make use of a little distilled water, with which I wash finally the finished negative; this removes the salts of lime that exist, more or less with other impurities, in all waters, in quantities quite sufficient to prevent the formation of a brilliant surface. (I consider this simple but cleanly operation one of the important photographic "insect cares.") Now set the negative up to drain and dry spontaneously, its face to the wall, and its lower part resting upon a slip of clean bibulous paper; it is as well to change this slip of paper once or twice: when surface dry, the negatives may be put into a grooved box to keep them from dust, and if more convenient, they may be varnished next day. All varnishes should be applied in a dry room.* Attach the back of the negative to a pneumatic holder kept for the purpose, and having poured into a glass measure more of the varnish than is required to cover the plate, proceed to pour on as much as the plate will hold; keep the plate as horizontal as possible,

* Just before varnishing, pass the back of the plate over the flame of a lamp, to drive off any moisture; when Amber varnish is used, allow the plate to cool before pouring on the varnish.

and let the varnish soak well in for twenty or thirty seconds; then gently raise the plate and pour back into the measure the excess, from the nearest right-hand corner. The varnish must not be dashed off, but the plate very gently elevated, at first only just out of the horizontal, and very gradually raised until it stands vertically on the edge of the measure; in this position let it remain a few seconds; on no account rock or give it any eccentric motion, and during the whole operation hold the breath, or turn the head away from the plate to breathe.

Always have two bottles for varnishing—the one to contain the stock of bright filtered varnish, the other to receive the portion poured back into the measure from the plate: when sufficient has been collected in this bottle, filter it through paper into the bright-stock bottle. Amber varnish filters most rapidly and with a very slight loss. The measure used should not be washed out, but kept turned down and free from dust; it is then always ready for the purpose required.

I possess a negative portrait of Sir John Herschel, taken about six years ago, which I value very much. This plate was varnished with some varnish made of very fine amber; it does not show the slightest sign of decay, is, indeed, harder than when first varnished. I have also negatives kept under various circumstances of damp and heat for eight years, and still perfect. I am not alone in expressing a strong opinion in favour of amber varnish; both my own experience and that of many photographers enable me to recommend it in preference to any other; and I think that the thanks of photographers are due to Dr. Diamond, who, I believe, some years ago, first introduced it to notice.

NOTE.—I have occasionally been asked to account for cracks in negatives ; fortunately this complaint is not of common occurrence, and therefore indicates an exceptional condition of the film. I have been at some pains to collect all the *reliable* information on this subject from those who have a large stock of negatives, some of which were varnished five years or more ago. From the facts collected, I have no hesitation in saying that all cracks in negatives arise from want of attention to the following points; viz., drying the negative, washing out the Hyposulphite or Cyanide, and lastly, the mode of drying the plate before varnishing. I have before said that Negatives should be allowed to dry *spontaneously*. It is of the utmost consequence as regards the permanency of the negative, that the fixing agent should be thoroughly removed ; also that the heat required to warm the plate before varnishing, should be applied in a regular manner, and only just sufficient to accomplish the object in view. When these three points are attended to, negatives will remain intact and free from cracks (as far as my own experience goes) for an indefinite time. Now, with reference to the first point, I say, let the film dry spontaneously, because there may be some conditions of a collodion film, presenting a proneness to spilt up, on the sudden and irregular application of heat to it, whilst still in a wet state: recollect that the edges of the glass plate are usually ground ; this restrains a natural tendency of the film to contract after removal of the Iodide of Silver by the fixing agent ; the film is therefore more or less in a state of tension, being extended, so to speak, by the

ground edges of the glass. The simple operation of passing a cloth (the thumb nail being inserted) round the edges of the negative, to the distance of one-eighth of an inch, sets the film free, removes the thick dirty edge of the negative, and is a safe-guard against injury arising from continued tension of the film; moreover, it adds to the neat appearance of the negative, and admits of the film being overlapped with the varnish,—an additional advantage. The reason for scrupulous attention to my second point is sufficiently obvious: a slight trace of cyanide or hyposulphite might not show itself at first—sooner or later this wrapped up element of decay will begin to make itself known, and brings about a disintegration of the film. An impression has got abroad that cyanide of potassium requires for its removal less washing than the hyposulphite of soda. I think this is erroneous; my opinion is, that the former salt should be as well washed out as the latter, and to effect this I believe that quite as much water is necessary. The collodion film has a very retentive action on most chemical solutions presented to it. I do not see why it should be less an absorbent of the cyanide than the cuticle of the body. I take this as a familiar illustration, because most people must have observed, that when the fingers have been cleaned with cyanide of potassium, the peculiarly disagreeable odour remains for a time, even after the most perfect ablution. Lastly, the instructions already given sufficiently explain the manner of warming a negative previous to varnishing. Varnishes will be selected by the photographic artist for qualities specially adapted to photographic use, viz., facility of

application, hardness of film, and absence of tackiness. These conditions are well fulfilled in the preparations spoken of in my paper "How to varnish the negative."

HOW TO PRINT FROM THE NEGATIVE

In order to print from the negative, very little skill in manipulation is necessary; but very much judgment and taste must be exercised in order to produce the best results, if really good proofs are cared for. Many look upon the operation of printing as mere drudgery—beneath notice; this work is frequently handed over to the care of boys and girls, who have as much feeling for art as the pressure-frame used to produce the picture. Having a first-rate negative, it is quite possible to obtain from it proofs of various qualities; so that, it may be, there are not two alike in a dozen prints, and perhaps one of them will be found superior to the other eleven. I admit that a difficulty exists, and one not easily removed; it lies solely in the variability of sunlight in this climate. At first sight it would appear easy enough to obviate this by a watchful examination of the picture whilst printing; such a course gives a proximate notion only of the real state of the print; for, presuming the day be dull, and occasional glimpses of sunshine flit over the printing-frame, it will be found impossible to calculate to a degree the amount of reduction that will take place in fixing the picture. If exposed for some time on a dull day without sun, the positive may appear to be very much overdone, and yet be too much acted upon whilst undergoing the necessary immersion in the bath of hyposulphite of soda, *in consequence of the greater reducing power of this salt on proofs printed in feeble light.*

I am, of course, taking for granted that there is a shade of intensity to be sought for in the positive picture, which the negative is capable of giving, and which shade shall be acknowledged to be that best suited to the particular subject represented. For the reasons just stated, it will be found difficult to obtain this quality at will with a variable sunlight. The natural deduction to be drawn from these remarks, therefore, is that, in order to produce from a negative several copies uniform in quality, it is necessary to print in direct sunlight; one or two experiments will then show the character of the negative: the time required to print from it, in order to obtain a special intensity of tone, can be easily noted. I do not now refer to colour; but, by intensity of tone, I mean that amount of force giving artistically the best result from a particular negative: and this leads me to another remark, viz., the quality of the negative; for supposing the same collodion to have been used for the production of a series of negatives of different subjects, the printing peculiarities of each negative will vary according to the subject represented, the colour of which, and quality of the light used to produce the negative, affect its resisting power to stop out rays of transmitted light. It is therefore necessary to be acquainted with the peculiarities of each negative. There is this advantage in printing in direct sunlight—the subsequent reduction can be calculated to a nicety, whether the negative be faint or vigorous; for, as I have before stated, the positive produced under these circumstances does not suffer such an excessive and variable reduction in the hyposulphite of soda as when a bad or variable light is used. I am, of course, aware

that some sort of compromise may be effected by very much over-printing, and then reducing the excess of intensity by a prolonged immersion in the hyposulphite of soda bath. I am by no means satisfied with this plan; the picture then is not of first-rate quality, but hard and inferior in tone, and seldom brilliant. Of course, in allowing for the over-printing, it is necessary to lay down a given time for fixing in hyposulphite of soda; I put this at half an hour, and never fix more than one proof in a dish at a time. Now it can be very readily demonstrated that positives printed in a bad light are much more rapidly acted upon by the hyposulphite of soda, as I have before said; nothing, therefore, seems so easy of confirmation as this proposition, that in proportion to the acting power of the hyposulphite of soda upon the reduced silver, so will be the action of other external influences of a chemical nature on the picture when finished. To my mind this appears only a plain, common-sense view of the case, and the inference to be drawn therefore is, that a greater general permanency is obtained by printing in direct sunlight. These observations may open up a new field for inquiry, and may perhaps account for the variableness in the permanency of photographic pictures. All good negatives should stand sunlight printing; I am certain that a finer definition of detail is obtained, and both a greater richness and brilliancy of colour, when prints are made under these circumstances.

I may as well remark here, that a faint negative, will under no conditions of light give, a fine, rich, and dark-coloured positive; the picture may certainly be

cooked in baths of gold and much variety of smudginess produced,—a dead, cold and leaden hue—shades of black fit only to represent scenes in pandemonium. This is the character of colour forced upon faint positives by over-dosing with gold. A well-printed positive of good vigorous colour will stand a longer immersion in the gold bath, and yet be free from the objectionable colour just described. There is considerable room for display of taste in the selection of shades and tones of colour in photographs, according to the subject represented; the most infelicitous choice is sometimes made. I think that a great deal of the evil is to be attributed to the wholesale and reckless use of gold, which, if skilfully used, is capable of producing every variety of good photographic colour.

I once heard of an amateur who apologized to his friend for the bad colour of a photograph he was anxious to present him with, at the same time saying, somewhat mournfully, "he had expended on it the contents of a 15-grain bottle of gold;" but even then it fell short of some ideal standard of perfection. The doctrine of sunlight printing which I have endeavoured to lay down would, of course, be fatal to general photographic business in this country; it would never do to be waiting upon and otherwise dodging our great luminary; the principle involved, however, may nevertheless be true, although its practice may be difficult or perhaps impossible. I am now addressing the few who, like myself, are anxious to produce at will a first-rate impression from a negative of good quality. The best toning process is that

now generally followed, viz., the Alkaline Chloride of Gold process. I use albuminized papier Saxe, either thick or thin—the latter when fine definition is required. Float each piece of paper for five minutes upon a solution of nitrate of silver 80 grains to 1 ounce of distilled water, and use it as soon as it is quite dry. I have observed that a brighter colour is obtained when the paper is used very soon after excitation; let the paper, however, be quite dry before using it; expose in the frame in the usual way. I far prefer the bars of pressure-frames fitted with screws—the contact is then so perfect all over. In sunlight the time of exposure will vary from ten minutes (the minimum time) to half an hour for ordinary subjects; but a much longer exposure will be necessary for the representation of black and white subjects, such as engravings. Be very careful to examine the print *in yellow light*, whilst printing: if the frame be opened even for a second or two in daylight, a slight general action of light will take place over the whole surface of the picture. Conduct the operations of toning and fixing in yellow light. When the print has reached the proper intensity (allowing for the reduction), remove it from the printing-frame, and wash away in several changes of common water all the nitrate of silver; when this has been properly effected prepare the following bath, but not before it is required for use:—

Solution of Bicarbonate of Soda, 40 minims

(Strength, 8 grains to 1 oz. distilled water).

Solution of Chloride of Gold, 20 minims

(Strength, 15 grains to 5 drachms of distilled water).

Distilled water, 4 oz. Mix.

The solutions both of gold and soda may be kept ready for use in separate bottles. I throw away the colouring bath after use. The above quantity will tone half a dozen pictures 10×8 , if warm tones only are required: the time of immersion varies from thirty seconds to two minutes. Over-colour the positive slightly, to allow for subsequent reduction in the hyposulphite of soda bath. Now wash away the excess of gold solution rapidly in two or three changes of water, and fix each proof singly in a bath of hyposulphite of soda, 1 oz. to 6 oz. of water. In order to make sure of the picture being perfectly fixed, let each proof remain in this bath half an hour—not less; then wash it in running water for twelve hours, and let it dry spontaneously. I have a strong feeling in favour of a particular colour for photographs; no word-painting will describe this or any other tone of colour; I shall be happy, however, to show to any one specimens of colouring by the above formula. It is very evident that paper treated and washed as just described, involving an immersion of twelve hours in liquids, must have undergone some alteration in the arrangement of its atoms; these are now of course more open, spongy, and porous, consequently the particles of silver forming the image must of necessity be somewhat divided and less compact than is desirable,—I think therefore more in a condition to absorb deleterious gases, and more susceptible of damage from moisture in the atmosphere, or other injurious influences. It is most desirable to restore the paper to its original condition; this is easily done at a very small charge by the hotpresser. The pictures must

not be over-rolled—such an action would be injurious to the surface. I order mine to be rolled flat only; this last operation is, I consider, most beneficial, both as regards the beauty and permanency of the finished photograph.

THOMAS'S

NEGATIVE COLLODION,

NEGATIVE COLLODION, WITH USUAL IODIZER.

NEGATIVE COLLODION, WITH CADMIUM IODIZER.

NEGATIVE COLLODION, WITH MAGNESIUM DO.

IODIZED NEGATIVE PORTRAIT COLLODION.

POSITIVE COLLODION, WITH IODIZER.

TREBLY IODIZED NEGATIVE COLLODION.

	s.	d.
20 oz. in two Solutions, Stoppered Bottles	16	0
10 oz. in two Solutions, ,, ,, 	8	6
4 oz. in two Solutions, ,, ,, 	4	0
4 oz. in two Solutions, Corked ,, 	3	2

*Each bottle is stamped with a coloured label bearing my name
and address.*

THE FOLLOWING PREPARATIONS ARE PARTICULARLY RECOMMENDED
TO THE NOTICE OF PHOTOGRAPHERS:—

NORMAL NITRATE OF SILVER BATH,

Prepared by R. W. THOMAS; 20 oz. Stoppered
Bottle, 7s. 6d.

OXIDE OF SILVER AND NITRIC ACID,

For correcting the Nitrate of Silver Bath, with full
instructions for use. Sold in cases 2s. each,
or by Post 2s. 6d.; also in bottles at 5s. 6d.
and 10s. 6d. each; and the Nitric Acid may
be had in 1s. bottles.

PURE CRYSTALS OF NITRATE OF SILVER,

Specially purified and dried for the Nitrate of Silver
Bath, 5s. per ounce.

THOMAS'S AMBER VARNISH,

This valuable Varnish for protecting Negative Pic-
tures is applied without heat. It dries imme-
diately; the coating will be found free from
stickiness, hard and transparent. It is pre-
pared from the finest Amber. Sold in Stoppered
Bottles at 1s. 6d., 2s. 6d., 4s. 6d., 6s. 6d., and
8s. 6d. each.

THOMAS'S ALBUMINIZED PAPER,

Carefully prepared. Whole size 12s. quire; half-size,
6s. quire; quarter size, 3s. quire; may be had
either of medium thickness or thin.

A
DESCRIPTIVE CATALOGUE
OF
PHOTOGRAPHIC APPARATUS,
ETC.,

MANUFACTURED AND SOLD BY

RICHARD W. THOMAS,

Operative Chemist, &c.,

AND MANUFACTURER OF

PURE PHOTOGRAPHIC CHEMICALS & PREPARATIONS,

10, PALL MALL,

LONDON.

1861.

A Catalogue of Photographic Apparatus can never be absolutely complete, owing to causes, which in the course of a few months may affect the prices of some articles, and also owing to improvements and modifications, which, from time to time, render it desirable to alter the construction of scientific instruments.

I take this opportunity of drawing special attention to my Improved Expanding Camera, the lightest and best Camera for Landscapes yet constructed; it may be had with plain motion or with the double swing back motion.

I propose this year adding to my very large stock of Photographic Apparatus, everything both of English and Foreign manufacture, calculated to be really useful to Photographers.

RICHARD W. THOMAS.

CAMERAS.

	£.	s.	d.
A MOST EFFICIENT EXPANDING CAMERA (square) for pictures 10 by 8 and under, complete	6	10	0
DITTO DITTO for pictures 12 by 10 and under complete	8	0	0
A MOST EFFICIENT EXPANDING CAMERA (square) with double swing back motion for pictures 10 by 8 and under, complete	8	0	0
DITTO DITTO for pictures 12 by 10 and under, complete	10	0	0
A SPANISH MAHOGANY SLIDING CAMERA , for collodion pictures 12 by 10 in., in slide, with three loose frames for pictures 10 by 8 in., 8½ by 6½ in., and 6 by 5 in., double action front, and bottom board hinged to turn up, thus forming a box, with a brass handle screwed in a plate to the top ..	7	10	0
A SPANISH MAHOGANY SLIDING CAMERA , for collodion pictures 12 by 10 in., &c., &c., as above, brass bound for India, focussing glass, and slide brass bound	9	10	0
A SPANISH MAHOGANY SLIDING CAMERA , for collodion pictures 11 by 9 in., in slide, with three loose frames for pictures 10 by 8 in., 8½ by 6½ in., and 6 by 5 in., double action front, and bottom board hinged to turn up, thus forming a box, with a brass handle screwed in a plate to the top ..	6	10	0
A SPANISH MAHOGANY SLIDING CAMERA , for collodion pictures 11 by 9 in., in slide, &c., &c., brass bound for India focussing glass, and slide brass bound	8	10	0
A SPANISH MAHOGANY SLIDING CAMERA , for collodion pictures 10 by 8 in., in slide, with three loose frames for pictures 8½ by 6½ in., 6 by 5 in., and 5 by 4 in., double action front, and bottom board hinged to turn up, thus forming a box, with a brass handle screwed in a plate to the top ..	5	10	0
A SPANISH MAHOGANY SLIDING CAMERA , for collodion pictures 10 by 8 in., in slide, &c., &c., brass bound for India focussing glass, and slide brass bound	7	0	0

DOUBLE SLIDES FOR THE PAPER PROCESSES:

For 12 by 10 in. Camera each	2	0	0
„ 11 by 9 in. „ „	1	15	0
„ 10 by 8 in. „ „	1	10	0
DOUBLE SLIDES FOR THE PAPER PROCESSES, brass bound for India:			
For 12 by 10 in. Camera each	2	10	0
„ 11 by 9 in. „ „	2	5	0
„ 10 by 8 in. „ „	2	0	0

CAMERAS, &c.

								£	s.	D.
PINE BOXES, Blackened, clamped, lock, hinges, and hasps, to carry two double paper slides:										
For 2, 12 by 10 in. slides..	..	..	..	..	..	..	each	0	11	6
„ 2, 11 by 9 in. „	..	..	..	..	..	..	”	0	10	0
„ 2, 10 by 8 in. „	..	..	..	..	..	..	”	0	8	6

- A SQUARE SPANISH MAHOGANY SLIDING PORTRAIT CAMERA, with one Collodion Slide, for pictures in loose frame $8\frac{1}{2}$ by $6\frac{1}{2}$ in., 6 by 5 in., and 5 by 4 in., single action front, and bottom board hinged to turn up, and a brass handle screwed in a plate to the top 4 10 0
- A SQUARE SPANISH MAHOGANY SLIDING PORTRAIT CAMERA, with one Collodion Slide, for pictures in loose frame, 6 by 5 in., 5 by 4 in., and 4 by 3 in. 2 5 0
- A SQUARE SPANISH MAHOGANY SLIDING PORTRAIT CAMERA, with one Collodion Slide, for pictures in loose frame, 5 by 4 in. and 4 by 3 in. 1 17 6
- A SQUARE SPANISH MAHOGANY SLIDING PORTRAIT CAMERA, with one Collodion Slide, for pictures in loose frame, $4\frac{1}{2}$ by $3\frac{1}{2}$ in. and $3\frac{1}{2}$ by $2\frac{3}{4}$ in. 1 10 0
- A STEREOSCOPIC CAMERA, of Spanish mahogany, with one Collodion Slide, capable of taking plates of two sizes, viz., $6\frac{1}{2}$ by $3\frac{1}{2}$ in. and $5\frac{1}{2}$ by $3\frac{1}{2}$ in., the camera mounted on parallel laths, complete 3 3 0
- A TWIN LENS STEREOSCOPIC CAMERA, of Spanish mahogany, sliding front for cutting off foreground, suitable for both landscapes and portraits 3 0 0
- A DOUBLE STEREOSCOPIC CAMERA, of Spanish mahogany, for two Lenses, with one Collodion Slide, for plates 7 in. square, giving four pictures, i. e. two stereoscopic sets on one plate, the camera mounted on parallel laths, complete .. 5 5 0

N.B. This arrangement is particularly recommended for professional purposes, a great saving of time being effected by the use of this instrument.

All the cameras above enumerated are made of the closest grained solid Spanish mahogany, highly dried and well seasoned, to withstand change of temperature. Owing to their simple and perfect construction, the focus may be obtained readily and accurately, by means of the sliding body, which quite obviates the inconvenience of focussing with rack and pinion of lens.

Elongating sliding bodies, or cones, can be fitted to any of the landscape cameras.

LENSES, &c.

ROSS'S ORTHOGRAPHIC PETZVAL LENSES,

With complete set of Waterhouse's Inner Diaphragms,

FOR

LANDSCAPES AND GROUPS.

The arrangement of the optical properties of these Lenses resembles that originally employed by Professor Petzval. The peculiar form of this instrument gives it the following advantages:—It has only one-third the bulk of the ordinary single combination; the axial aberrations are completely corrected; the actinic focus embodies more of the chemically-acting rays than that of the single combination, and these perfectly coincide with the visual rays at their focus; it covers a large flat field, and produces straight marginal lines, which appear in their true perspective places, while their perpendicularity is so affected as to remove every trace of the usual inward leaning of architectural objects. All these qualities of excellence are naturally unobtainable with the ordinary single combination, if we except a loose approximation to actinism and flatness of field. Up to the present time, optical corrections producing the above-named qualities can only be affected by Professor Petzval's second combination having a *Negative* focus.—See *A. Ross's Paper in No. 56 of "Photographic Notes," p. 175.*

DIMENSIONS AND PRICES
OF
ORTHOGRAPHIC LENSES.

Size of Picture.		Size of Group.		Diameter of Front Lens.	Back Focus.	PRICE.								
						Rigid Setting.			Sliding tube Adjustment.			Sliding Tube with Rack and Pinion.		
in.	in.	in.	in.	in.	in.	£.	s.	d.	£.	s.	d.	£.	s.	d.
6 by 5	4 by 3	$\frac{9}{10}$	8	3	15	0	4	5	6	4	17	6		
$8\frac{1}{2}$ by $6\frac{1}{2}$	6 by 5	$1\frac{1}{4}$	$10\frac{1}{2}$	4	12	6	5	4	6	6	0	0		
10 by 8	$7\frac{1}{2}$ by $5\frac{1}{2}$	$1\frac{1}{2}$	14	5	15	6	6	10	0	7	10	0		
12 by 10	$8\frac{1}{2}$ by $6\frac{1}{2}$	$1\frac{8}{10}$	$16\frac{1}{2}$	7	0	0	7	18	6	8	18	6*		
15 by 12	10 by 8	$2\frac{1}{4}$	$19\frac{1}{2}$	8	0	0	9	5	0	10	5	0*		
18 by 16	12 by 10	3	26	12	12	0								
22 by 20	15 by 12	$3\frac{6}{10}$	$31\frac{1}{2}$	17	0	0								
25 by 21	18 by 16	4	34	21	0	0								

* Hook's universal joint handle, for 12 by 10 and 15 by 12 lenses, price £1 0s. 0d.

LENSES, &c.

ROSS' PHOTOGRAPHIC LENSES.

£ s. d.

PORTRAIT LENSES.

The whole of these glasses give fine and correct definition, both at the centre and margin of the picture, and have their chemical and visual foci coincident.

No. 1—PORTRAIT LENS, consisting of two achromatic combinations, mounted in tubes, with rack and pinion movement, the lenses $1\frac{1}{4}$ in. diameter, and $4\frac{1}{2}$ in. focal length from the back glass, producing pictures on plates or paper, 4 by 3 in. and under 5 0 0

No. 2—DITTO, DITTO, the lenses $2\frac{1}{4}$ in. diameter, and 6 in. focal length, for pictures on plates or paper, 5 by 4 in. and under 8 0 0

No. 2A—DITTO, DITTO, the lenses $2\frac{1}{2}$ in. diameter, and $7\frac{1}{2}$ in. focal length, for pictures on plates or paper, 5 by 4 in. and under 10 10 0

This lens produces LARGER PORTRAITS than the above.

No. 3—DITTO, DITTO, the lenses $3\frac{1}{4}$ in. diameter, and 8 in. focal length, for pictures on plates or paper, $6\frac{1}{2}$ by $4\frac{1}{4}$ in. and under 16 0 0

No. 3A—DITTO, DITTO, for pictures $8\frac{1}{2}$ by $6\frac{1}{2}$ in. 25 0 0

No. 4—DITTO, DITTO, the lenses $4\frac{1}{4}$ in. diameter, and 12 in. focal length, for pictures on plates or paper, $8\frac{1}{2}$ by $6\frac{1}{2}$ in. and under 36 0 0

No. 5—A COMBINATION FOR PORTRAITURE, $3\frac{1}{4}$ in. diameter, $6\frac{1}{2}$ in. focal length, producing portraits in one half the usual time, on plates or paper, 4 by 3 in. 30 0 0

This lens is specially useful in dull weather, or in private rooms, or when taking the portraits of children or animals.

No. 6—A LENS producing pictures of a size suitable for locket, having the same properties as the preceding one 6 0 0

FOCUSSING GLASSES:

French	each	0 3 0
Ross', in case	„	0 16 0

Note—Mr. Thomas undertakes to supply and select Lenses of any of the other makers.

CAMERA STANDS, &c.

CAMERA STANDS.

£ s. d.

A VERY SUPERIOR MAHOGANY TRIPOD STAND, with brass triangular top, all the screws and fittings of brass, the legs jointed, being the most portable, steady, and perfect stand made, for large cameras, with screw and nut	6	10	0
DITTO DITTO, for smaller cameras	4	10	0
A SUPERIOR ASH TRIPOD STAND, with brass triangular top, for large and heavy cameras, with screw and nut.. .. .	2	2	0
A SUPERIOR ASH TRIPOD STAND, with brass triangular top, screw and nut.. .. .	1	15	0
A SUPERIOR ASH TRIPOD STAND, for stereoscopic camera, of lighter construction, with screw and nut	1	12	6

CANVASS CASES, with solid leather ends, for the above stands, each	0	10	6
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TABLE STANDS, with adjustments for the operating room, with rack work to raise or lower the table, from £3 0 0 to	8	8	0
---	---	---	---

GUTTA PERCHA BATHS.

AIR-TIGHT GUTTA PERCHA BATHS, for carrying the silver solution, mounted in mahogany case, the supports moveable, with dipper :

For Plates 15 by 12 in.	2	15	0
„ 12 by 10 in.	2	0	0
„ 10 by 8 in.	1	15	0
„ 8½ by 6½ in.	1	10	0
The above Baths, with top piece, brass bound, to give extra strength each extra	0	5	0

Mahogany Covers, to protect the plate from the action of light whilst iodizing each extra	0	5	0
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AIR-TIGHT GUTTA PERCHA BATH, for stereoscopic plates, mounted in mahogany case, supports, mahogany cover, and dipper, complete	1	1	0
--	---	---	---

GUTTA PERCHA & GLASS BATHS, &c.

AIR-TIGHT GUTTA PERCHA BATHS, of ordinary construction, with dipper: £ s. d.

For Plates 12 by 10 in.	..	..	..	..	..	1	5	0
„ 10 by 8 in.	..	..	..	..	..	0	18	6
„ 8½ by 6½ in.	..	..	..	..	..	0	15	6
„ 6 by 5 in.	..	..	..	..	..	0	13	0

GUTTA PERCHA BATHS, with mahogany supports and glass dipper:

For Plates 15 by 12 in.	..	..	..	..	..	1	0	0
„ 12 by 10 in.	..	..	..	..	..	0	15	0
„ 11 by 9 in.	..	..	..	..	..	0	13	0
„ 10 by 8 in.	..	..	..	..	..	0	11	6
„ 8½ by 6½ in., moulded	..	..	..	..	..	0	7	6
„ 6 by 5 in.	..	..	..	..	..	0	5	6
„ 5 by 4 in.	..	..	..	..	..	0	5	0

All the above baths are made of the purest gutta percha.

GLASS BATHS.

SOLID GLASS BATHS & DIPPER MOUNTED
WITH STAND AND COVER,
IN VARNISHED DEAL.

						£	s.	d.
For Plates	15 by 12	...	...	...	...	2	10	0
„	„ 12 by 10	...	...	...	...	1	15	6
„	„ 10 by 8	...	...	...	...	1	7	6
„	„ 9 by 7 or 8½ by 6½	...	...	...	...	1	5	0
„	„ 6 by 5	...	...	...	...	0	15	0
„	„ 6¾ by 3¼	...	...	...	...	0	15	0

GLASS BATHS.

SOLID GLASS BATHS MOUNTED TO CARRY
SOLUTION IN HONDURAS MAHOGANY
WITH CAP AND DIPPER.

						£.	s.	d.
For Plates	15 by 12	...	...	...	..	3	10	0
"	" 12 by 10	...	...	...	...	2	10	0
"	" 10 by 8	...	...	...	...	2	0	0
"	" 9 by 7 or $8\frac{1}{2}$ by $6\frac{1}{2}$	...	...	...	...	1	15	0
"	" 6 by 5	...	...	...	...	1	5	0
"	" $6\frac{3}{4}$ by $3\frac{1}{4}$	...	...	...	...	1	2	6

PRINTING FRAMES.

PRINTING FRAMES—OUTSIDE FRAME OF
VARNISHED PINE, MAHOGANY
HINGED BACK BOARD, BIRCH BARS AND
BOX WOOD SCREWS, WITH LOOSE
PIECE OF FELT.

						£.	s.	d.
For Pictures	15 by 12	...	...	...	...	1	18	6
"	" 12 by 10	...	...	...	...	1	5	0
"	" 10 by 8	...	...	...	...	1	1	0
"	" 9 by 7 or $8\frac{1}{2}$ by $6\frac{1}{2}$	...	...	...	...	0	17	6
"	" 6 by 5	...	...	...	...	0	14	6
"	" $6\frac{3}{4}$ by $3\frac{1}{4}$	...	...	...	...	0	13	0

These Printing Frames are admirably constructed; by means of screws, the contact of the prepared surface of the paper with the negative is made most complete.

Note—the above Frames may be had with springs if preferred.

PLATE BOXES.

PLATE BOXES.

PINE PLATE BOXES, varnished and polished :

			For 1 doz. Plates.			For 2 doz. Plates.		
			£	s.	d.	£	s.	d.
3½ by 2½ in.	..	..	0	3	0	0	4	0
4 by 3 in.	..	..	0	3	6	0	4	6
4½ by 3½ in.	..	..	0	3	6	0	4	6
5 by 4 in.	..	..	0	4	0	0	5	6
5½ by 3½ in.	..	..	0	4	0	0	5	6
6 by 5 in.	..	..	0	4	6	0	6	0
8 by 6 in.	..	..	0	6	0	0	7	6
8½ by 6½ in.	..	..	0	6	0	0	7	6
9 by 7 in.	..	..	0	6	6	0	8	6
10 by 8 in.	..	..	0	7	6	0	9	6
12 by 10 in.	..	..	0	9	0	0	11	6
15 by 12 in.	..	..	0	11	6	0	15	6

The above sizes can be had also in mahogany.

METAL PLATE BOXES.

			For 1 Doz. Plates.			For 2 Doz. Plates.		
			£	s.	d.	£	s.	d.
4½ by 3½ in.	..	..	0	2	6	0	3	0
5 by 4 in.	..	..	0	2	6	0	3	0
6½ by 3½ in.	..	..	0	2	6	0	3	0
6½ by 4½ in.	..	..	0	3	6	0	4	6
6 by 5 in.	..	..	0	3	6	0	4	6
8½ by 6½ in.	..	..	0	5	0	0	6	6
9 by 7 in.	..	..	0	5	6	0	7	0
10 by 8 in.	..	..	0	6	0	0	7	6
12 by 10 in.	..	..	0	7	0	0	8	6

PATENT PLATE GLASS.

PATENT PLATE GLASS.

BEST PATENT PLATE GLASSES, the edges ground and slightly bevelled both sides on the surface of edges :

Size,	3½ by 2¾ in.	..	..	..	..	per doz.	£	s.	d.
"	4 by 3 in.	..	..	..	..	"	0	2	6
"	4½ by 3½ in.	..	..	..	..	"	0	2	9
"	5 by 4 in.	..	..	..	..	"	0	3	6
"	5½ by 3½ in.	..	..	..	..	"	0	3	6
"	6 by 5 in.	..	..	..	..	"	0	4	8
"	6½ by 3½ in.	..	..	..	..	"	0	4	6
"	6½ by 4¾ in.	..	..	..	..	"	0	5	0
"	8 by 6 in.	..	..	..	..	"	0	7	6
"	8½ by 6½ in.	..	..	..	..	"	0	8	6
"	9 by 7 in.	..	..	..	..	"	0	9	6
"	10 by 8 in.	..	..	..	..	"	0	12	6
"	11 by 9 in.	..	..	..	..	"	0	14	6
"	12 by 10 in.	..	..	..	..	"	1	0	0

VIGNETTE GLASSES.

Inches.	Each.	Inches.	Each
	s. d.		s. d.
2½ by 2 ..	1 0	8½ by 6½ ..	2 8
3¼ by 2¾ ..	1 4	9 by 7 ..	3 4
4¼ by 3¼ ..	1 8	10 by 8 ..	4 0
5 by 4 ..	2 0	12 by 10 ..	4 8
6½ by 4¾ ..	2 4	14 by 10 ..	5 8
		18 by 12 ..	8 8

STEREOSCOPIC VIGNETTES, 2s. 4d. EACH.

DIRECTIONS.

These plates (the halo of which is permanently burnt into the body of the glass) are manufactured for the purpose of producing the Vignette style of printing, adapted to every description of Pressure Frame.

MODE OF USING THE VIGNETTES: Fasten the Vignette with gum paper on a piece of card-board, having an opening cut in it a quarter of an inch smaller than the Vignetting Glass; then place the card-board outside the plate glass, *i.e.*, between the plate glass and frame. By this plan the possibility of breakage is not only obviated, but additional softness is given to the picture.

TRAVELLING CASES.

TRAVELLING CASES.

These boxes are made to hold the gutta percha bath and solution, one dozen glass plates, and a stock of prepared solutions for the day's work, viz., six-ounce bottle for collodion (made expressly with a moderately wide mouth, and lip slightly turned up), one pint bottle for fixing solution, with cover, one pint bottle for developing solution, gutta percha developing cup, pneumatic holder, and two divisions for cloths and silk handkerchief. By means of a novel arrangement, the box is fitted with two compartments, the one for wet, and the other for clean plates; when a negative, therefore, has been taken, it can be at once placed out of harm's way, in the wet compartment, where the draining continues in a manner favourable to even drying, the moisture being conveyed away through waterproof channels to the outside of the box. These cases are made of mahogany, with lock, hasps, and handle, fitted with stoppered bottles, and filled with apparatus, &c., as under, viz.:—

	£.	s.	d.
Air-tight Gutta Percha Bath, in mahogany case, of the best construction, and Glass Dipper for plates 12 by 10 in., Pneumatic Holder, Developing Cup, one dozen Patent Glass Plates, ground edges, 12 by 10 in., arranged as above described, complete	6	2	6

Outside measurement of case, 19½ in. by 8 in. by 15 in.

DITTO, DITTO, with moveable blocks, capable of taking plates either 12 by 10 in. or 10 by 8 in., fitted complete	6	10	0
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DITTO, DITTO, for plates 10 by 8 in., fitted complete	5	0	0
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Outside measurement of case, 18 in. by 13 in. by 7½ in.

DITTO, DITTO, with moveable blocks, capable of taking plates either 10 by 8 in. or 8½ by 6½ in., fitted complete	5	7	6
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DITTO, DITTO, for plates 8½ by 6½ in., fitted complete	5	1	0
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Outside measurement of case, 17 in. by 13½ in. by 17½ in.

PHOTOGRAPHIC TENTS.

PHOTOGRAPHIC TENTS.

A good Photographic Tent has long been a desideratum; that now described is in every respect all that the most fastidious operator could desire; it should indeed be more properly called, a portable dark room, for all photographic operations can be conducted therein with the greatest ease and comfort. The material is of three thicknesses; it has been selected and dyed carefully with a view to its perfect efficiency. The colour of the outer covering is nearly white, and the inner orange, the window being made of a fabric coloured to withstand the action of direct sunlight. The tent is fitted with a syphon ventilator, developing table, and sink of varnished deal with India rubber tubing, conveying away the waste water to outside of tent, two tent lines, which may be used if necessary, and pegs for fixing it permanently. The whole can be put up or taken down in two minutes, and forms a package about three feet long, easily carried by an assistant. As these tents are manufactured by R. W. THOMAS in quantity, one can always be seen set up at 10 Pall Mall.

	£.	s.	d.
Price of Tent and Table	10	10	0
Price of Developing Sink, for plates 12 by 10 in., and under, with six feet of vulcanized India rubber tubing, for con- veying away the waste water	1	1	0
Price of Case and Straps for Travelling	1	5	0
A cheaper and light Photographic Tent, with table, waterproof covering, and outer case	3	15	0

£. s. d.

MOULDED GUTTA PERCHA DISHES. A set of four made to fit into each other for portability, $1\frac{1}{8}$ in. deep:—

Internal measure, 11 by 9 in.	..	..	..	each	0 4 6
" 11½ by 9½ in.	..	..	..	"	0 5 0
" 12 by 10 in.	..	..	..	"	0 5 6
" 12½ by 10½ in.	..	..	..	"	0 6 0

Or £1 the set of four.

MOULDED GUTTA PERCHA DISHES:—

Internal measure,	8 by 6 in., 1½ in. deep	..	..	each	0 2 6
"	9 by 7 in. "	..	..	"	0 3 0
"	19 by 14 in., 2 in. deep	...	..	"	1 1 0

GLASS DISHES, recommended for silver solution :—

Internal measure, 10½ by 8½ in.	..	..	..	each	0 10 6
„ 11 by 9 in.	..	..	..	„	0 13 0
„ 12½ by 10 in.	..	..	..	„	0 15 0
„ 14 by 11 in.	..	..	..	„	1 0 0

These Dishes are of British plate cemented, they can be made to order of any dimensions.

MOULDED GLASS DISHES in one piece, perfectly flat bottom and spout at the corner:—

Internal measure, 11½ in. by 9½ in.	..	..	..	each	0	7	6
„ 9½ in. by 7½ in.	..	..	..	„	0	4	6
„ 7 in. by 3½ in.	..	..	..	„	0	1	6

GUTTA PERCHA BOTTLES AND FLASKS, from one ounce
to one gallon.

GUTTA PERCHA FLASKS, with Cap and Loops, for carrying water :

[illegible]

SCALES AND WEIGHTS, &c.

SCALES AND WEIGHTS.

	£.	s.	d.
SCALES AND WEIGHTS, in mahogany box, with set of drachm, scruple, and grain weights	0	8	6
DITTO, DITTO, smaller size	0	7	6
DITTO, DITTO, with glass pans	0	10	6
DITTO, DITTO, larger, with moveable glass pans, and weights to 1 oz., complete	0	12	0
DITTO. DITTO, with pillar, box end beams, and glass pan (moveable), with mahogany stand and drawer	1	15	0
A SET OF ENGLISH WEIGHTS, in mahogany box, from $\frac{1}{10}$ of a grain to 1,000 grains, with nipper, complete	0	17	6
A SET OF FRENCH WEIGHTS, from decigramme to 200 grammes	1	5	0

STOPPERED COLLODION BOTTLES, GRADUATED FOR MIXING THE TWO SOLUTIONS.

	s.	d.
1 ounce... .. .	1	6
2 " 	2	0
4 " 	2	6
8 " 	3	0
12 " 	3	6
16 " 	4	0
20 " 	5	0

GLASS MEASURES ACCURATELY GRADUATED.

2 ounces	1	6
4 "	2	0
10 "	2	6
20 "	3	6
40 "	4	6
60 "	7	0
80 "	7	6

PHOTOGRAPHIC PAPERS, &c.

PNEUMATIC HOLDERS	each, 4s and 0	£	s.	d.
		0	2	6

BUFF AND BOX	0	5	0
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BRUSHES, CAMEL'S HAIR.—

Round, in quill	each 0	1	0
Flat, 2 in. wide	"	0	3
„ 2½ in. wide	"	0	4
„ 3½ in. wide	"	0	5
Buckle's Brush, in case	"	0	2
„ extra large	"	0	3

PHOTOGRAPHIC PAPERS.

ALBUMENIZED PAPER, size, 22½ by 17½ in.	per quire 0	12	0
„ „ „ 17½ by 11½ in.	"	0	6
„ „ „ 11½ by 8½ in.	"	0	3

CANSON FRERES,' positive	"	0	3
„ „ negative	"	0	2

GERMAN PAPER, Saxe thick	"	0	4
„ „ „ medium	"	0	3

WHATMAN'S PAPER, negative, a very superior paper for the Talbot-type process, it is about 8 years old, and about 30 reams are in stock at 10, Pall Mall, price per quire, 4s., or per ream 3 10 0

TURNER'S PAPER, negative, size, 24 by 19 in.	per quire 0	10	0
„ „ „ 19 by 15 in.	"	0	7

CANSON'S PAPER, salted, size, 22½ by 17½ in.	"	0	6
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STOUT BIBULOUS PAPER, white	"	0	2
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SWEDISH PAPER	"	0	5
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PAPIER JOSEPH	"	0	1
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FILTERING PAPER, particularly recommended for filtering the nitrate of silver bath and other chemical solutions, sold in packets of three different sizes, at 1s., 2s., and 3s. per packet each size, or per quire 0 3 0

MISCELLANEOUS.

GLASS DIPPERS, the edges polished;

Length, 6 in.	Width, 1½ in.	£.	s.	d.
7½ in.	2 in.	0	1	0
9 in.	2 in.	0	1	6
9½ in.	1¼ in.	0	1	6
12 in.	2½ in.	0	2	0
14 in.	3 in.	0	2	6
16 in.	3 in.	0	3	0
19 in.	3 in.	0	3	6
22 in.	3 in.	0	4	0

FRENCH MEASURES:

30 grammes	0	2	0
650 "	0	11	6
1,000 "	0	12	6
1,500 "	0	15	0

GLASS MORTARS AND PESTLES:

2 ounces capacity..	0	2	6
5 "	0	4	0
10 "	0	5	6
20 "	0	6	6
30 "	0	8	6
40 "	0	10	6

GLASS RODS:

Stirring Rods, 7 in. long ..	each	0	0	6
Spreading Rods, 11 in. long ..	"	0	1	0

A large assortment of Glass, Gutta Percha, and Wedgwood FUNNELS.

DEVELOPING STANDS, with levelling screws	3s., 4s., and	0	6	0
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SPIRIT LEVELS ..	each	0	6	6
CIRCULAR DITTO ..	"	0	3	6

TIN STILL, and refrigerator, complete ..	each	1	1	0
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HEAD RESTS, of the best construction, for fastening to the back of chair ..	each	1	1	0
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